

dummy wafers and the confusion of the dummy wafers having small numbers of times of use with the dummy wafers having large numbers of times of use. For these reasons, the dummy wafers can be used effectively without any problem when plasma cleaning is carried out.

Furthermore, in accordance with the present invention, the apparatus can have a plurality of processing chambers and can transfer wafers and dummy wafers by the same conveyor. Since plasma cleaning can be carried out by managing the timing of cleaning of each processing chamber by the controller, the cleaning cycle can be set arbitrarily, dry cleaning can be carried out without interrupting the flow of the processing, the processing can be efficiently made and the productivity can be improved.

As described above, according to the present invention, there are effects that the construction of the apparatus is simple, the substrates to be processed are free from contamination and the production yield is high.

What is claimed is

1 A method of transferring a substrate, using an apparatus comprising

a cassette for receiving plural substrates, said cassette being located at a position of which an upper region is open to a cassette transferring path air,
an atmospheric transferring device for transferring, one by one, said substrates;
a vacuum transferring chamber having a vacuum transferring means;
plural vacuum processing chambers for processing, one by one, said substrates,
a device having a first lock chamber in which said substrates are carried in and carried out, one by one, between said atmospheric transferring device and said vacuum transferring chamber and a second lock chamber in which said substrates are carried in and carried out, one by one, between said atmospheric transferring device and said vacuum transferring chamber; and
opening and closing devices for opening and closing one of the first and second lock chambers each time a substrate is carried into said one of the first and second lock chambers, one by one, and each time a substrate is carried out of said one of the first and second lock chambers, one by one,

wherein the method comprises the steps of

taking out, one by one, said substrates from said cassette at said position, by said atmospheric transferring device,
carrying in a substrate taken out from the cassette, to one of said first and second lock chambers in air, closing off said one of said first and second lock chambers, from said atmospheric transferring device, by using the opening and closing devices, evacuating said one of said first and second lock chambers,
transferring said substrate to any one of said plural vacuum processing chambers from said one of said first and second lock chambers in a vacuum, through said vacuum transferring chamber,
processing said substrate in said one of said plural vacuum processing chambers,
transferring said substrate, which has been subjected to processing, to one of said first and second lock chambers in the vacuum through said vacuum transferring chamber.

closing said one of said first and second lock chambers, to which the substrate is transferred after the processing, from said vacuum transferring chamber, by using the opening and closing devices, and, after that, opening the one of the first and second lock chambers, having the substrate therein, to air, by using the opening and closing devices, and taking out said substrate in said one of said first and second lock chambers, to which the substrate is transferred after the processing, by said atmospheric transferring device and receiving said substrate in said cassette.

2 A method of transferring a substrate according to claim 1, wherein an opening and closing at an air side and a vacuum side of said first lock chamber, by using the opening and closing devices, and an opening and closing at an air side and a vacuum side of said second lock chamber, by using the opening and closing devices, are controlled independently, respectively.

3 A method of transferring a substrate according to claim 2, wherein said substrate which has been subjected to processing is returned to a cassette from which it originated.

4 A method of transferring a substrate according to claim 1, wherein said substrate which has been subjected to processing is returned to a cassette from which it originated.

5 A method of transferring a substrate according to claim 2, wherein after a processing of a substrate, the processed substrate is transferred through said vacuum transferring chamber and said substrate is processed in another vacuum processing chamber

6 A method of transferring a substrate according to claim 5, wherein said one of said plural vacuum processing chambers, and said another vacuum processing chamber, perform different processing of the substrate

7 A method of transferring a substrate according to claim 1, wherein said one of said plural vacuum processing chambers, and said another vacuum processing chamber, perform different processing of the substrate

8 A method of transferring a substrate according to claim 1, wherein said one of said plural vacuum processing chambers, and said another vacuum processing chamber, perform different processing of the substrate

9 Method of using a conveyor system for processing substrates in plural vacuum processing chamber installation portions, the conveyor system including

an atmospheric loader;
a vacuum loader, and
two lock chambers, which are separately disposed, each having an atmospheric loader side and a vacuum loader side, and having a gate valve for said atmospheric loader side and another gate valve for said vacuum loader side,

wherein said vacuum loader has

(1) a transfer chamber connected to the two lock chambers via the another [valve] gate valve,
(2) conveyor structure, and
(3) plural vacuum processing chamber installation portions,

the method comprising the steps of:
transferring substrates to be processed, one by one, separately from said atmospheric loader to a lock chamber of the two lock chambers, in a state of keeping only one substrate in each of said two lock chambers,
providing a vacuum in each of said two lock chambers, after providing a vacuum in each of said two lock chambers, transferring the substrates, one by one, from

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the lock chambers to at least one of said plural vacuum processing chamber installation portions, via said transfer chamber,
processing the substrates in said at least one of said plural vacuum processing chamber installation portions;
after said processing, transferring the processed substrates, one by one, from said at least one of said

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plural vacuum processing chamber installation portions to the lock chambers, via said transfer chamber; and keeping the processed substrates in the lock chambers, and transferring the processed substrate from the lock chambers to said atmospheric loader

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